

Memorandum of Agreement

Between The Delaware Department of Transportation And The Delaware Department of Natural Resources And Environmental Control Concerning Stormwater Quality Management

1.0 Introduction

1.1 Intent

The Delaware Department of Transportation (DelDOT) and the Delaware Department of Natural Resources and Environmental Control (DNREC) recognize that it is sometimes not practicable to provide stormwater quality management in accordance with Section 10 of the Delaware Sediment and Stormwater Regulations (DSSR). This Memorandum of Agreement (MOA) establishes procedures which DelDOT may choose to follow in lieu of those stipulated in the DSSR.

The procedures outlined herein shall be considered variance procedures and are to be implemented only when it has been demonstrated that exceptional circumstances exist at the project site which would cause undue hardship and not fulfill the intent of State and Federal stormwater quality laws if DelDOT were to maintain strict adherence to the provisions embodied in the DSSR.

This MOA will allow DelDOT to make a statewide initiative to meet, in part, the Federal nonpoint source pollution and stormwater permit program requirements contained in Section 6217 (g) of the Federal Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), and the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit Program (NPDES MS⁴) authorized by the Federal Clean Water Act Reauthorization Amendments of 1987.

By this agreement, the parties intend that, where DelDOT has demonstrated it cannot provide stormwater quality management on a given project, the "deficit" thus created will be mitigated at another DelDOT project, or existing road, highway, or bridge within the same watershed or another watershed determined by DNREC to be in greater need of water quality control.

1.2 Definitions

Disturbed Area - The total surface area of land located within the limits of construction of a DelDOT construction project.

Drainage Area - The entire geographic area that contributes surface water to a point of discharge. One or more drainage areas comprise a subwatershed.

Enhancement - Actions performed in existing waters or wetlands to increase one or more wetland functions and values.

Practicable - Available and capable of being completed after taking into consideration cost and feasibility in light of the overall stormwater quality goals.

Restoration - Actions performed which reestablish the natural hydrologic and biotic function of a former wetland or degraded stream corridor.

Stormwater Management Credit - The actual acreage of land which has been afforded stormwater quality treatment through implementation of a stormwater management facility (e.g. the maximum number of credits which can be accredited to a watershed due to any one stormwater management facility is equivalent to the drainage area to that facility).

Stormwater Management Debit - The actual acreage of land within the disturbed area of a construction project which is allowed to go untreated for stormwater quality management.

Stormwater Management Facility - A man-made structure built specifically to provide stormwater quality treatment (e.g. stormwater management pond, constructed wetland, etc.); or a natural land feature which has been restored or enhanced to provide stormwater quality benefits (e.g. enhanced existing wetland, restored former wetland).

Subwatershed - The entire geographic area that contributes surface water to a tributary of one of Delaware's forty one (41) watersheds (e.g. Pike Creek is a subwatershed of White Clay Creek watershed). One or more subwatersheds comprises a watershed.

Watershed - The entire geographic area that contributes surface water to one of Delaware's forty one (41) major drainageways listed as follows:

- | | |
|---------------------------------|--------------------------|
| 1. Appoquinimink River | 22. Indian River Bay |
| 2. Army Creek | 23. Iron Branch |
| 3. Assawoman Bay | 24. Leipsic River |
| 4. Blackbird Creek | 25. Lewes Rehoboth Canal |
| 5. Brandywine Creek | 26. Little Assawoman |
| 6. Broad Creek | 27. Little Creek |
| 7. Broadkill River | 28. Marshyhope Creek |
| 8. Buntings Branch | 29. Mispillion River |
| 9. Cedar Creek | 30. Murderkill River |
| 10. Chesapeake & Delaware Canal | 31. Naamans Creek |
| 11. Chesapeake Drainage System | 32. Nanticoke River |
| 12. Choptank River | 33. Pocomoke River |
| 13. Christina River | 34. Red Clay Creek |
| 14. Deep Creek | 35. Red Lion Creek |
| 15. Delaware Bay | 36. Rehoboth Bay |
| 16. Delaware River | 37. Shellpot Creek |
| 17. Dragon Run Creek | 38. Smyrna River |
| 18. Elk Creek | 39. St. Jones River |
| 19. Gravely Branch | 40. White Clay Creek |
| 20. Gum Branch | 41. Wicomoco River |
| 21. Indian River | |

2.0 Scope

2.1 Applicability to State and Federal Programs

The terms set forth in this agreement take effect immediately and may be applied to any project reviewed and approved for stormwater management by DelDOT which functions as a Delegated Agency in accordance with Section 5 of the DSSR. Projects reviewed and approved prior to the effective date of this MOA are excluded.

When utilized, the criteria in this MOA will completely fulfill the DSSR's requirements for the roadway project being considered and partially fulfill CZARA, and NPDES MS⁴ requirements effective in Delaware.

2.2 Implementation of MOA Criteria

The criteria and procedures outlined by this MOA shall be implemented only after DelDOT has demonstrated that granting of a variance, in accordance with Section 3 of the DSSR, is appropriate and mutually advantageous to DelDOT and the water quality goals of the State and Federal stormwater programs.

The stormwater management approach described by this MOA should be viewed only as an option to the procedures contained in the DSSR. DelDOT retains the right to follow the provisions of the DSSR on any given project, even after the granting of a variance, if the alternatives available under this MOA are later determined to be impractical.

Appendix 'A' provides guidelines on implementing the provisions of this MOA.

2.3 Quantity Control Not Covered

This agreement pertains to stormwater quality management only. This agreement does not relieve DelDOT from the requirement to meet the applicable provisions set forth in the DSSR as to reduction of peak discharge rates.

3.0 Terms

3.1 Major Roadway, Bridge, and Surface Transportation Related Projects

For major roadway widening, new alignments, and surface transportation related projects, DelDOT shall maximize the implementation of stormwater quality management on-site in accordance with the DSSR. Individual drainage areas within a larger project may be considered for eligibility under the terms of this MOA only after traditional approaches have been investigated and ruled out for cost and feasibility reasons. If, based on the information supplied by the project manager, the Stormwater Engineer determines that site conditions warrant the granting of a variance within specific drainage areas of a larger project, the project manager will be notified of the options that are available within the terms of this MOA.

3.2 Minor Roadway, Bridge, and Surface Transportation Related Projects

For minor roadway improvements (e.g. addition of turn lanes at intersections, bridge approach roadway widening, addition of bike lanes, safety improvements, transportation enhancement projects, etc.) DelDOT first shall investigate all possible water quality control options available within the limits of the project being considered. If no practicable alternative is found, the Stormwater Engineer shall consider the validity of a variance from the DSSR for some or all of the disturbed area associated with the project in question. If, based on the information supplied by the project manager, the Stormwater Engineer determines that site conditions warrant granting of a variance, the project manager will be notified of the options that are available within the terms of this MOA. The variance may be extended to all or only a portion of the overall project.

Projects meeting the waiver and exemption criteria established in Section 3 of the DSSR (e.g. roadway restoration, rehabilitation, and reconstruction within the limits of the existing pavement) shall not be construed to be regulated under this MOA to any greater degree than they may be under the DSSR.

3.3 Allowable Stormwater Quality Management Alternatives

The water quality management alternatives listed below comprise the acceptable stormwater management facility options available for consideration under this MOA. In determining the most appropriate water quality management alternative to implement, DelDOT shall take into account the condition and water quality improvement needs of the watershed in which the project is located. The chosen alternative shall be the option which offers the most immediate and discernible improvement to water quality.

1. Structural Control.

Structural stormwater management facilities providing water quality control for a drainage area equivalent to or exceeding the area requiring treatment at the roadway project location. The acceptable structural control alternatives are as follows:

- a) Construction of a wetland for stormwater treatment;
- b) Wet extended detention pond;
- c) Dry extended detention pond;
- d) Infiltration basin or trench;
- e) Sand filter;
- f) Biofiltration swale;
- g) Other practices which achieve 80% mass reduction in suspended solids.

2. Source Control.

Control of existing or potential contaminants at their source when this can be identified. The number of pollutant sources which shall be controlled and the overall cost of the control effort shall be commensurate with size and scope of the roadway project under consideration. The acceptable source control alternatives are as follows:

- a) Installation of material storage facilities;
- b) Elimination of illicit connections to the storm drain system;
- c) Other controls meeting the goals of the State and Federal stormwater quality programs and deemed appropriate by the Stormwater Engineer.

3. Enhancement & Restoration.

Water quality and habitat enhancement or restoration projects. As a minimum, the drainage area treated by the enhancement or restoration project shall be equivalent to or exceed the area requiring treatment at the roadway project location. The acceptable alternatives are as follows:

- a) Restoration or enhancement of the hydrologic and biotic properties of degraded tidal or non-tidal wetlands;
- b) Reforestation of cut woodlands and/or exposed bare earth;
- c) Removal of existing roadway or parking lot pavement and replacement with a pervious material, preferably grass. The section of existing pavement shall be similar in character as the section of new pavement in terms of the quantity and type of pollutants generated. This shall be determined by comparing land uses and traffic volumes at each location;
- d) Retrofitting existing stormwater management facilities to provide extended detention for the first inch of runoff. The cumulative drainage area of one or more existing facilities slated to be retrofitted shall equal or exceed the area requiring treatment at the roadway project location. Multiple existing facilities may be replaced with one larger facility provided it is designed to meet both the water quantity and quality control requirements of the DSSR. The design of any facility proposed to replace several existing ponds shall include a downstream analysis to a point of natural or man-made constriction to verify that the new facility does not cause a flooding problem or aggravate an existing one.

3.4 DNREC Oversight

The DNREC, Division of Soil & Water Conservation, Sediment & Stormwater Management Program shall have primary oversight of this MOA. The effectiveness of this agreement will be reviewed during their triennial review of the DelDOT Sediment & Stormwater Program at which time they will recommend to DelDOT whether to continue or alter this agreement.

The DelDOT Stormwater Engineer will send written notification to the manager of the Sediment & Stormwater Management Program at DNREC when DelDOT proposes to employ the terms of this agreement for a single project or a group of projects. This notification will invite all interested environmental resource and permitting authorities to participate in the selection of an alternative water quality management measure. A meeting time, date, and location to review project(s) proposing to follow the terms of this MOA will be listed in the notification.

The role of the various environmental resource and permitting authorities shall be to provide expert advice and guidance to DelDOT in the location and selection of appropriate sites and projects by prioritizing the water quality efforts which are needed within the various watersheds to mitigate the

water quality impacts related to stormwater runoff. The final choice of the available alternatives shall be made by DelDOT considering cost and feasibility.

DelDOT shall provide to DNREC an annual statement of the stormwater quality credits and debits broken down by watershed.

3.5 Accounting Procedures

DelDOT shall keep an accounting by watershed of the actual acreage of land in each watershed afforded stormwater quality control as a "credit" and balance this against the actual acreage of land developed but left untreated as a "debit". The credits and debits shall be accredited as they are made and kept in such format as will be most accessible to both parties (e.g. computer database with network connection).

Credits and debits shall be accumulated and withdrawn in acres or fractions thereof. Both credits and debits will be accredited according to watershed as defined herein. Projects can only deposit or withdraw acreage within their respective watershed or another watershed determined by DNREC to be in greater need of water quality control.

Debits may be taken from one or more watersheds in advance of implementing a stormwater management facility up to a statewide limit of 5 acres, measured by taking the cumulative sum of all outstanding debits in all watersheds.

DelDOT will be required to construct a stormwater management facility upon exceeding the 5 acre statewide limit, or when a debit balance of less than five (5) acres has been carried in any watershed for a period exceeding three (3) years.

DelDOT agrees to initiate a project for stormwater management and secure a funding source within three (3) years of the first debit accredited to any watershed.

3.6 Maintenance

Nothing in this agreement shall be construed to alter or eliminate DelDOT's ongoing responsibility under the DSSR to inspect annually and maintain all stormwater management facilities owned by DelDOT.

3.7 Modifications

The terms of this MOA may be modified upon written agreement of both parties.

3.8 Termination

This MOA shall be terminated upon written notification by either party at which time any remaining credits accrued within a watershed shall be void and any outstanding debits shall be mitigated by

immediate initiation of a project to provide stormwater quality management in conformance with this agreement or the DSSR.

Approved:

This agreement shall become effective upon the last date signed.

Feb, 8, 1996
(Date)

3.11.96
(Date)

Amiel Canby
Secretary, Delaware Department of Transportation

Christopher M. Fulmer
Secretary, Department of Natural Resources &
Environmental Control

Appendix A

Design Guidance

Design By State Regs

Section 10 of the DSSR outlines the design requirements for implementing stormwater management on land development projects such as subdivisions and highways. The approach described in the regs incorporates both the water quantity control and water quality control components in one facility. The regs also establish an order of preference for the types of stormwater management measures. Wet extended detention ponds are the preferred alternative because they best incorporate both the water quality and water quantity control components in one facility. As an illustration of the design approach stipulated in the regs, consider the figure below which shows a highway traversing the landscape:

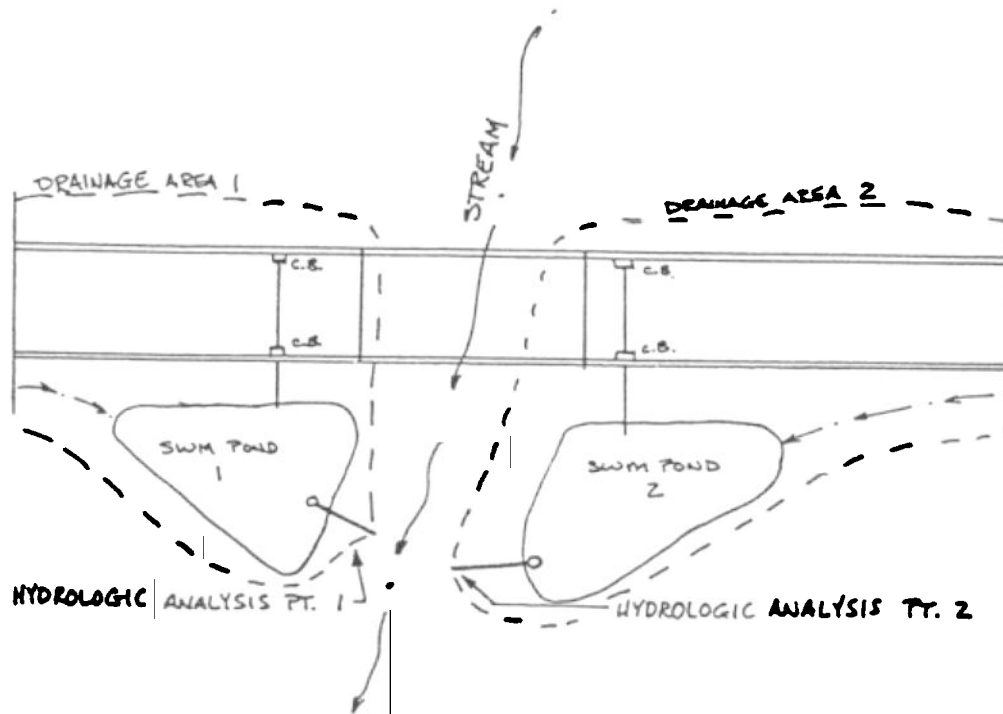


FIG.1: TRADITIONAL APPROACH TO SWM
N.T.S.

Areas upstream of the proposed highway are unaffected by the project and will have no adverse impact on downstream areas. Therefore, flow from upstream is conveyed through the project limits by means of a culvert or bridge without stormwater management controls being imposed.

Development within the proposed project, however, may have an impact on downstream areas. To determine if this is the case, hydrologic analysis points for the proposed project are located out of the stream in order to compare the relative change in peak discharge rates for the pre-project and post-project conditions. If the increase in peak discharges is significant water quantity control must be provided, usually by installing a pond. The water quality control requirements are then incorporated into the pond design. This normally entails designing the pond to release the "first flush" (the larger concentration of pollutants typically carried in the first one half to one inch of runoff) over an extended period of time to induce physical settling of the pollutants.

Reason for the MOA

Under certain site conditions (because of the character of the existing land use, the relatively small area of the pavement widening, or similar reason) the hydrologic analysis may determine that there is no significant increase in peak discharges at the two points of study. When this is the case, flood control is not required. However, water quality control still needs to be addressed and the preferred method is a wet extended detention pond – one at each of the two analysis points. For long linear projects like highways, it is common to span several watersheds - thus the proliferation of many small ponds.

Also, it is sometimes the case that a suitable location for a water quality pond is not available at the project site. The designer then is forced to resort to another means of providing water quality control which is likely to be more costly and less efficient. In the end, it is often questionable as to whether the water quality benefits justify the time and expense of the effort.

Faced with the dilemma of having to build and maintain a large number of small ponds and the frequent occurrence of lack of suitable locations to site them, DelDOT and DNREC have agreed to follow the procedures outlined in this MOA.

Design by the MOA

Example 1: The Case When Water Quantity Control Is Not Required

Again, consider the site depicted in Figure 1. This time the hydrologic analysis indicates that no significant increase in runoff will be generated by the proposed project. Therefore, the project is eligible for a waiver of water quantity control. For water quality control, the designer would normally have to design a pond to treat the first flush. But under the terms of the MOA this is not necessarily the case.

This MOA offers the designer the option of providing water quality control for their project in another more suitable location within a regional watershed. Also, the impacts of several projects can be mitigated in one location with one regional type stormwater pond. This will help minimize the overall number of ponds and the associated maintenance burden. In this way, it is possible to maximize the overall effectiveness of the water quality control effort in each watershed because this MOA allows and encourages a watershed approach to water

quality management. DeIDOT and DNREC are obligated by this agreement to collaborate in choosing and placing water quality management measures in the locations that will offer the most likely improvement to our State's critical aquatic habitats.

Example 2: The Case When Water Quantity Control Is Required

Under the approach outlined in this MOA, quantity control is not covered. That means, if the hydrologic analysis indicates that quantity control is required under the regs, then it must be provided "on-site". However, some balancing of drainage areas may be allowed on a case by case basis when site constraints would make it very difficult or expensive to install a pond. Consider the following example:

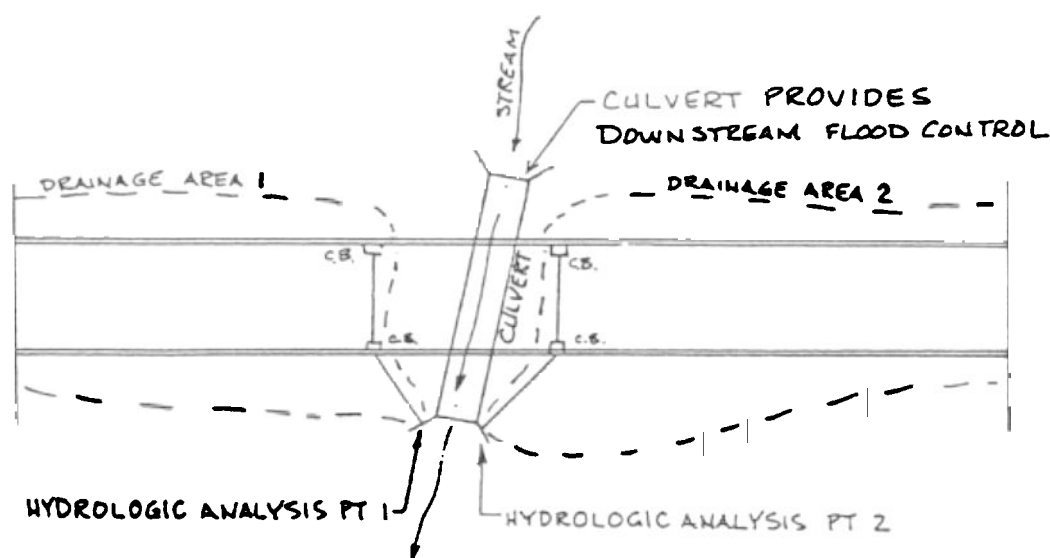


FIG. 2: MOA APPROACH TO SWM

N.T.S.

A highway traverses a landscape as before in Figure 1. The analysis points are located in the same places. The hydrologic analysis indicates an increase in peak discharge rates such that water quantity control is required, but no suitable location exists to place a pond. Without this MOA, the designer would be faced with a very difficult situation. The only probable solution would be a more expensive and higher maintenance option. However, it may be possible to mitigate the increased flooding potential without a pond and then address the water quality control elsewhere by following the terms of the MOA.

In the case of Figure 2, it may be possible to decrease the size of the cross culvert to reduce the peak discharge rates by an amount equivalent to the increase generated by the two drainage areas. For instance, if drainage areas one and two had a combined increase of 10 cfs representing a 25% increase in peaks from these areas, it might be possible to size the cross culvert to reduce downstream flows by 10 cfs, taking advantage of available upstream storage. This will balance the flow downstream to the same peak discharge rates as the pre-project condition - meeting the water quantity control requirements for the site in question. Then another location can be sought to locate a pond to address the water quality control requirements which were not addressed "on site".

Of course, the feasibility of this balancing approach is very site specific. For instance, it assumed that upstream properties were not impacted by the increased backwater from the culvert and that wetland permitting authorities were agreeable to using the cross culvert as a flood control structure ¹. But the point is that when the MOA is invoked, the designer has greater flexibility in meeting the stormwater management requirements for their project - - possibly in ways which do not require construction of a pond.

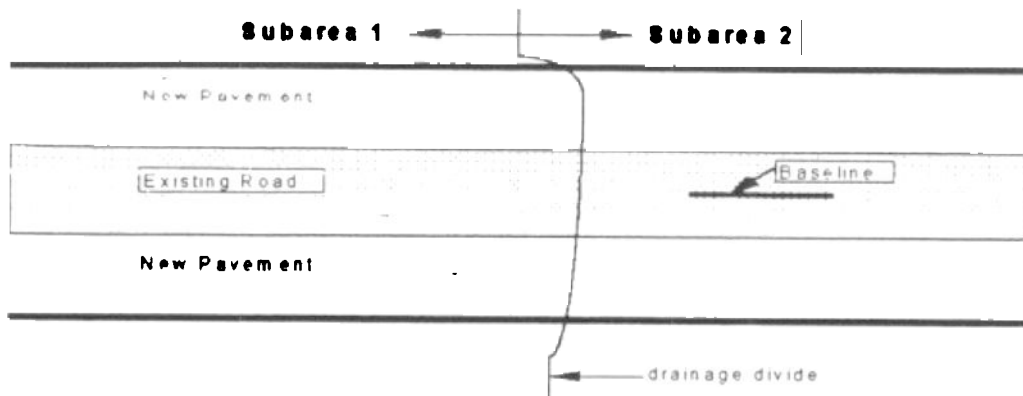
1. If a cross culvert is used as a flood control structure, it will be added to the Department's stormwater management facility inventory. Any subsequent roadway or bridge project affecting this structure must preserve its flood control characteristics, or provide an equivalent alternate means of achieving flood control.

Worksheet

DOT/DNREC MOA for Stormwater Quality Management

The following guidelines are used to account for “Credits” and “Debits”. The accounting should be made for each subarea and totaled for the project using the worksheet, page 4.

CASE 1: Widenning on Existing Road



Subarea 1

Topography and other constraints are such that NO water quality measure will be constructed.

- Untreated new pavement is accounted a debit.
- Untreated existing pavement is considered neutral (neither debit nor credit)

Subarea 2

Topography and other factors allow the construction of a pond to treat runoff from most paved areas and open space consisting of lawns, meadows, woodland, cropland and roadside ditches.

- Treated open space is considered neutral.
- Treated existing pavement is accounted a credit.
- Untreated existing pavement is considered neutral
- Treated new pavement is considered neutral.
- Untreated new pavement is accounted a debit.

Whole Project:

All subareas separated by a drainage divide are evaluated following the above guidelines. Total credit and total debit are computed. If total credit is more than total debit, the excess credit will be used in other projects.

If debit is more than the total credit, the designer must look for other options under the MOA guidelines to make up the deficit.

8/19/96

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Worksheet

Project Name and Number

Watershed Name.

By

Date:

[illegible]